

### BIDENS MOTTLE VIRUS OF BEDDING PLANTS

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Bidens mottle virus (BMoV) has been previously reported to infect lettuce (*Lactuca*) and endive (*Cichorium*) (7), lupine (*Lupinus*) (4), *Bidens* and *Lepidium* (3), and *Fittonia* (8). Recent studies by Logan et al. (5) have shown this virus to be found in several species of bedding plants in Florida. Those species found to be naturally infected included: *Rudbeckia hirta* L. (coneflower), *Zinnia elegans* Jacq., and *Ageratum conyzoides* L. Several other bedding plant species shown to be susceptible when mechanically inoculated were: *Calendula officinalis* L., *Callistephus chinensis* (L.) Nees (China aster), *Dimorphoteca pluvialis* (L.) Moench (Cape marigold), *Gaillardia X grandiflora* Van Houtte, *Helianthus annuus* L. (common sunflower), *Helichrysum bracteatum* (Venten.) Andr. (strawflower), *Petunia X hybrida* Hort. Vilm.-Andr., *Stokesia laevis* (J. Hill) Greene (Stokes' aster), and *Verbena X hybrida* Voss. All of these bedding plants, except for *Petunia* (Solanaceae) and *Verbena* (Verbenaceae), belong to the Compositae. The potential importance of BMoV in Florida's foliage production can be appreciated by the fact that in 1980, the bedding plant industry accounted for \$8 million (1).

**SYMPTOMS.** Infected plants show a wide range of symptoms, ranging from stunting, mottling, leaf distortion, color break in flowers, and flower abortion as with *Rudbeckia*, to complete lack of symptoms in *Gaillardia*. Flower abortion is seen in *Ageratum*, *Helianthus*, as well as *Rudbeckia* (Fig. 1). Symptoms on lettuce and endive can be easily confused with those caused by lettuce mosaic and turnip mosaic viruses (6). In almost all cases, infected plants are stunted when compared to their healthy counterparts.

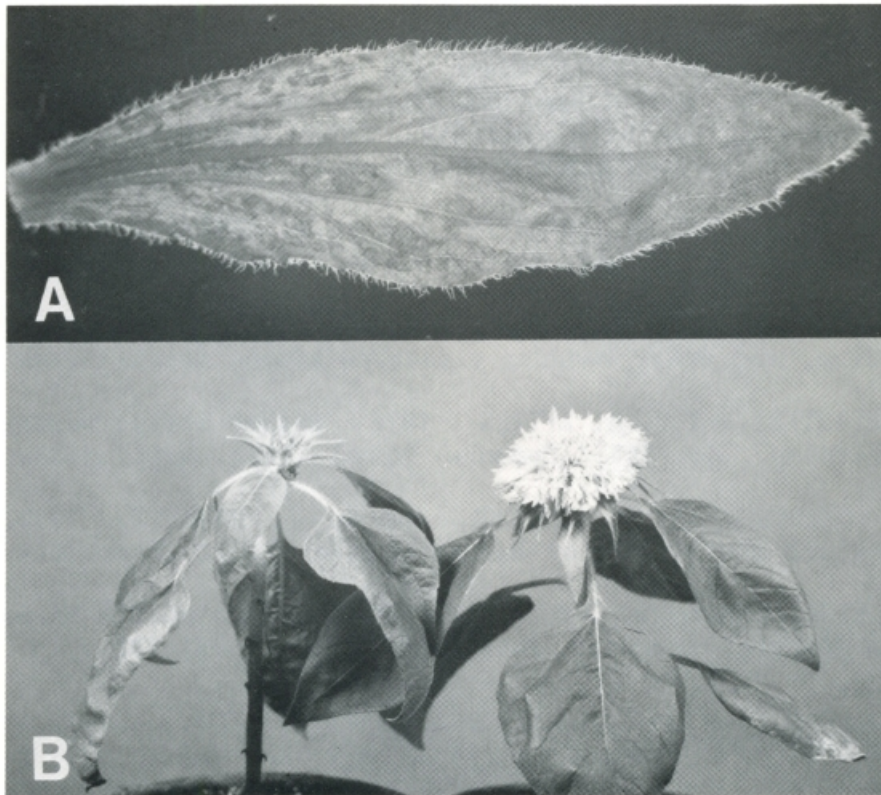


Fig. 1. Bidens mottle virus. A) Mottling of *Rudbeckia* leaf infected with BMoV. B) Flower abortion and leaf distortion of infected *Helianthus annuus* 'Teddy Bear' plant (left) compared to healthy (right). (Photo courtesy of A. E. Logan and F. W. Zettler).

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**CAUSAL AGENT.** BMoV belongs to the potyvirus group, the largest group of plant viruses, and affects both agronomic crops and foliage ornamentals. Identification of potyviruses can be made by observation of flexuous, rod-shaped, viral particles with the electron microscope and by characteristic cylindrical inclusions seen in epidermal strips stained with the calcomine orange and Luxol brilliant green combination, when viewed with the light microscope (2). Inoculation of Chenopodium amaranticolor Coste & Reynier gives local lesions, whereas a systemic mottle is produced in subsequent growth flushes of Nicotiana X edwardsonii Christie & C. W. Hall. Specific serological tests can also be made with antisera to BMoV.

**DISEASE DEVELOPMENT.** BMoV exists commonly in the weed hosts, Bidens pilosa L. and Lepidium virginicum L. This, coupled with aphid transmissability and the known presence of BMoV in agronomic crops, creates the potential for significant spread of this virus not only within the state of Florida, but also to other states where propagative materials are shipped. Fortunately, BMoV is not known to be seed transmitted, but it is readily transmitted by vegetative propagation of infected plants.

**CONTROL.** Careful attention should be paid to those plants known to be susceptible to BMoV. Symptomatic plants should be rogued when observed. Of course, aphid control is extremely important, as is control and eradication of the weed hosts, Bidens pilosa and Lepidium virginicum.

**SURVEY AND DETECTION.** Any plants showing stunting, mottling, distortion of leaves and flowers, vein necrosis, flower color break, or flower abortion should be suspect of being infected with BMoV. The proximity of any of these crops to lettuce or endive fields or weed hosts should also be noted. When submitting samples for diagnosis, send a whole plant or material which could be propagated for further evaluation.

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